



DATA BASE FOR EESS SATELLITES OPERATING IN THE BAND 8025 – 8400 MHz

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BACKGROUND

- **MOST EARTH OBSERVATION SPACECRAFT OPERATE IN THE BAND 8025 - 8400 MHz (X-BAND)**
- **SIGNIFICANT INCREASE OF INTERFERENCE EXPECTED**
- **SFCG IDENTIFIED A NEED TO ASSESS SPECTRUM CONGESTION AND INTERFERENCE PROBABILITIES IN X-BAND BASED ON A DATA BASE CONTAINING CURRENT AND FUTURE SPACECRAFT**

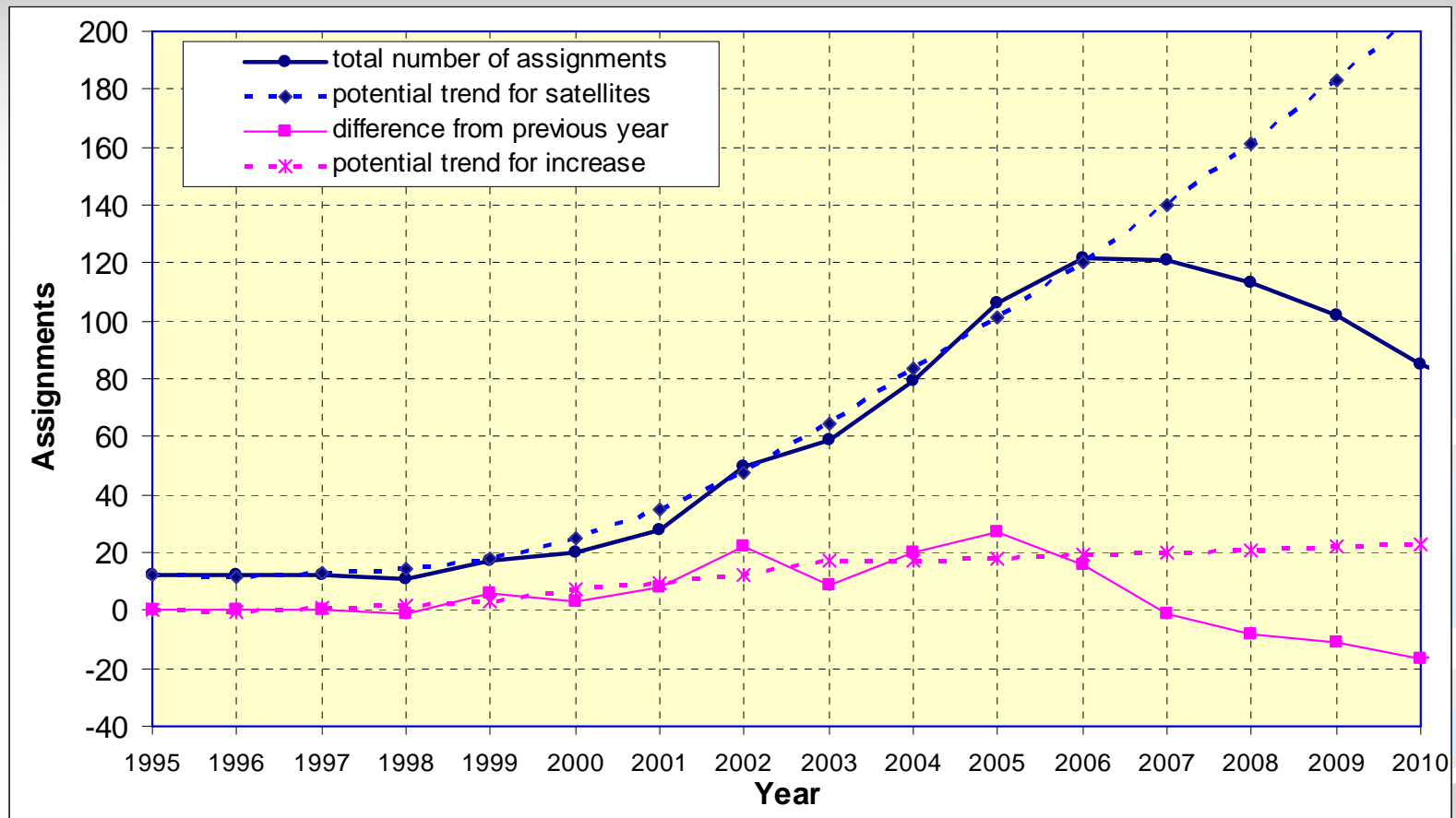
DATA BASE CONTENTS

- **DATA WERE COLLECTED FROM**
 - SFCG MEMBER AGENCIES
 - ITU MASTER REGISTRY
 - PRIVATE OPERATORS, FCC
- **COLLECTION OF DATA STARTED IN 2003 AFTER FIRST WORKSHOP ORGANIZED BY NASA IN ORLANDO (MARCH 2003)**
- **DATA BASE HAS BEEN MAINTAINED BY ESA AND IS USUALLY UPDATED TWICE PER YEAR**
- **DATA ARE BELIEVED TO BE QUITE REPRESENTATIVE REGARDING KEY CHARACTERISTICS OF ACTUAL SYSTEMS, HOWEVER**
 - MANY RECORDS ARE NOT COMPLETE
 - MORE DETAILED INFORMATION IS DESIRABLE FROM SOME AGENCIES / OPERATORS

DATA BASE DETAILS

- **DATA BASE HAS BEEN COMPILED IN EXCEL FORMAT**
- **CURRENT NUMBER OF RECORDS IS AROUND 180**
- **KEY INFORMATION IS INCLUDED ON**
 - **ORBITAL CHARACTERISTICS**
 - **CARRIER FREQUENCIES, BANDWIDTHS, MODULATION TECHNIQUES**
 - **LAUNCH DATE, LIFE TIME**
 - **EIRP LEVELS, ANTENNA CHARACTERISTICS**
 - **EARTH STATIONS**

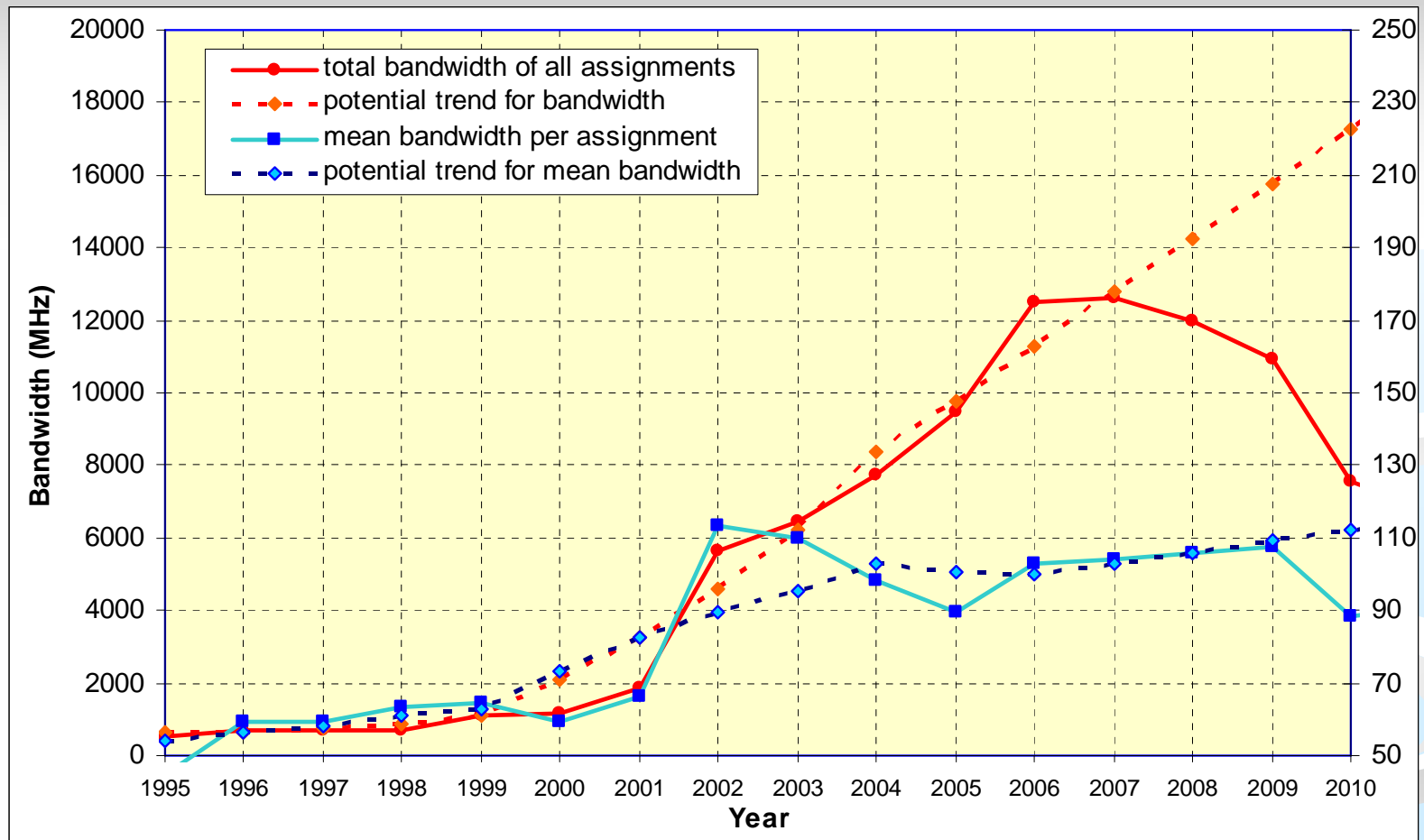
TOTAL NUMBER OF FREQUENCY ASSIGNEMENTS AND DIFFERENCE WITH RESPECT TO PREVIOUS YEAR



REMARKS ON EVOLUTION OF SATELLITES

- **SIGNIFICANT DEPLOYMENT OF SATELLITES OVER THE LAST DECADE**
- **BASIS FOR DATA IS THE ANNOUNCED OR EFFECTIVE DATE FOR BRINGING THE SATELLITE NETWORK INTO OPERATION**
- **IN THE ABSENCE OF INFORMATION ON PLANNED LIFETIME IT WAS ASSUMED THAT THE SATELLITE WOULD BE OPERATIONAL FOR 8 YEARS**
- **APPARENT DECREASE IN THE FUTURE IS NOT REAL BUT DUE TO SATELLITE FILINGS ONLY BEING MADE WHEN SCHEDULE IS RELIABLY KNOWN**

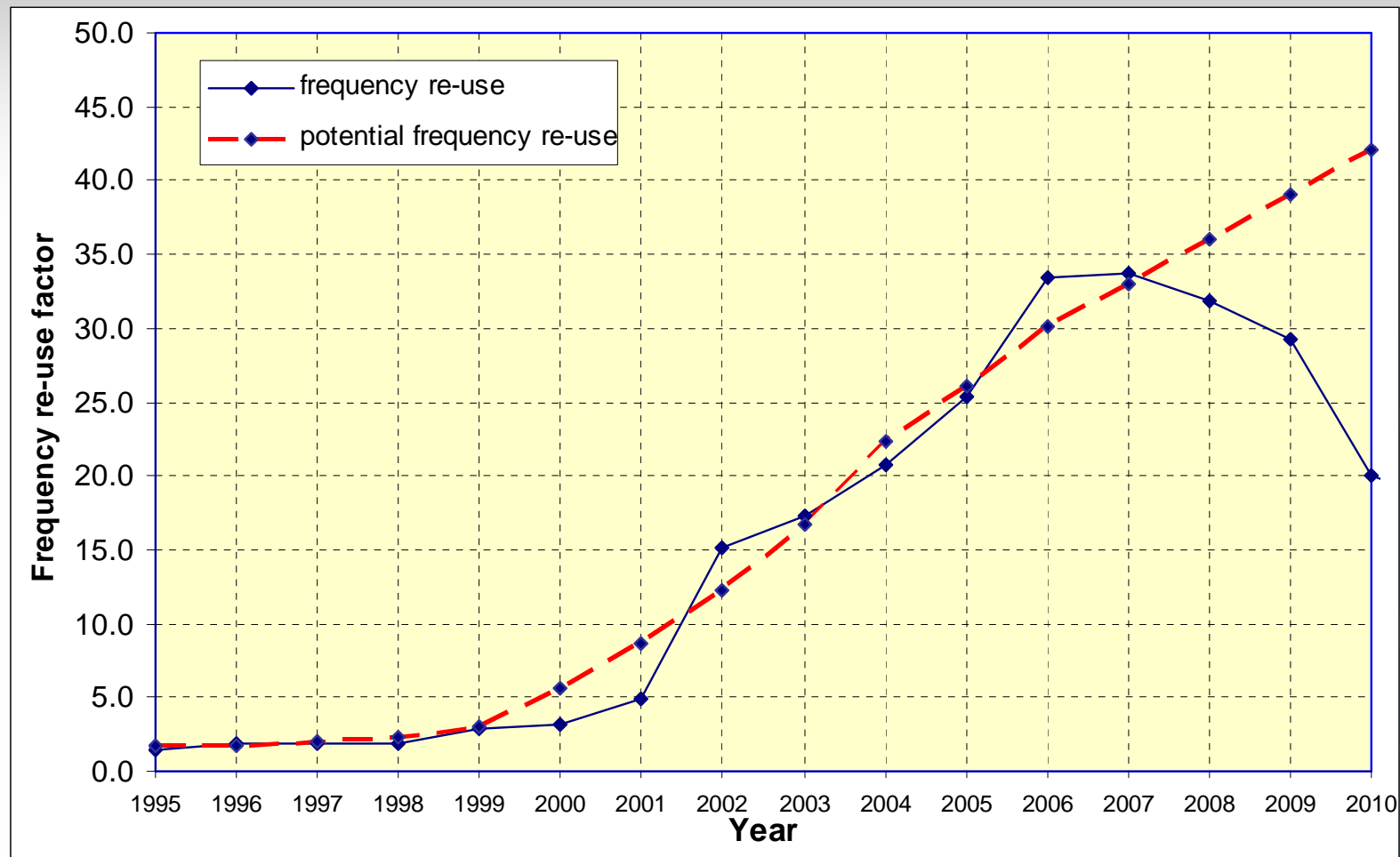
TOTAL BANDWIDTH USED BY ALL SATELLITES AND MEAN BANDWIDTH



REMARKS ON BANDWIDTH ASSESSMENT

- **BASIS FOR BANDWIDTH ASSUMPTIONS IS THE NOTIFIED NECESSARY BANDWIDTH WHICH IN MOST CASES EQUALS THE DATA RATE (QPSK IS THE MOST OFTEN USED MODULATION TECHNIQUE)**
- **AFTER DRASTIC INCREASE BETWEEN 2000 AND 2002, THE REQUIRED SPECTRUM APPEARS TO REMAIN CONSTANT SINCE 2003 WHICH IS DIFFICULT TO EXPLAIN AND COULD BE DUE TO:**
 - **LOW COST SATELLITES FOR LIMITED APPLICATIONS**
 - **MORE EFFICIENT DATA COMPRESSION TECHNIQUES**
 - **MORE EFFICIENT MODULATION TECHNIQUES**
 - **PURE COINCIDENCE**

ESTIMATED FREQUENCY RE-USE OF THE AVAILABLE 375MHz BANDWIDTH IN THE BAND 8025 – 8400 MHz



CONCLUDING REMARKS

- **A DATA BASE IS AVAILABLE IN EXCEL FORMAT CONTAINING FAIRLY REPRESENTATIVE INFORMATION ON KEY PARAMETERS FOR SATELLITES OPERATING OR PLANNING TO OPERATE IN THE BAND 8025 – 8400 MHz**
- **THE OBJECTIVE IS TO MAINTAIN A COLLECTION OF DATA ALLOWING INTERFERENCE SIMULATIONS, FREQUENCY PLANNING AND STATISTICAL ASSESSMENTS**
- **THE DATA BASE IS FREELY AVAILABLE TO ANYBODY HAVING A REASONABLE INTEREST WITH THE EXPECTATION THAT RECIPIENTS PROVIDE INFORMATION IN RETURN AND ASSIST IN IMPROVING IT**
- **CONTRIBUTIONS ARE INVITED TO HELP UPDATING AND COMPLETING THE RECORDS IN THE DATA BASE**